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DOT/RSPA/OHMS  
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January 11, 1996

Dockets Unit DHM-30  
Office of Hazardous Materials Safety  
Research and Special Programs Administration  
U.S. Department of Transportation  
400 Seventh St, S.W.  
Washington, D.C. 20590-0001

RE: Docket no. HM-220A  
Notice no. 95-13

Dear Sirs,

Through contact with CGA staff it is our understanding that DOT has extended the comment period on the subject NPRM until January 12, 1996.

In view of this Authorized Testing would like to comment as follows, apologizing in advance for the length and for any verbiage considered superfluous or redundant.

#### GENERAL COMMENTS

Authorized Testing fully concurs with the issues of concern advanced by RSPA in preamble to the proposed regulation change (column 3, page 54008, Federal Register/Volume 60, No. 201/Wednesday, October 18, 1995/Proposed Rules).

As with cylinder manufacturers, we believe it to be equally important that those charged with the responsibility to periodically reaffirm cylinder integrity levels be held accountable for the degree of expertise applied in doing so. This obviously includes independent inspectors who evaluate and advise the cylinder requalifier as well as the inspection/retest personnel actually performing the requalification. Misinformation and/or insufficient information provided to a retester can and often does promote continuity of inappropriate practices in a cylinder retest facility. We believe that the retest industry has a right to expect that erroneous information contradictory to regulation language and intent will not be dispersed by the inspector in the review for approval recommendations.

APPROVED BY  
U.S. DEPARTMENT OF TRANSPORTATION • TRANSPORT CANADA  
BRITISH HEALTH & SAFETY EXECUTIVE • NEW ZEALAND DEPARTMENT OF LABOUR  
THIRD PARTY QUALIFICATION INSPECTION OF COMPRESSED GAS CYLINDERS AND SPHERES  
CONSULTATION ON SPECIFICATION INTERPRETATION, PRESSURE VESSEL DESIGN, PROCESS CONTROL, ETC  
MEMBER BUREAU OF EXPLOSIVES • COMPRESSED GAS ASSOCIATION  
NATIONAL ASSOCIATION OF FIRE EQUIPMENT DISTRIBUTORS • AMERICAN SOCIETY FOR NON-DESTRUCTIVE TESTING

Our experience has shown that an adequate review of equipment capability, record keeping, personnel knowledge and thorough discussion of the safety issues involved requires a minimum of six hours to explore.

We feel that it must be realized that while cylinder requalification is likely the most important function of a retest facility, it is seldom the primary thrust of the business. Many are gas distributors, fire suppression service companies, etc.

It is most important to the retest facility to protect the safety of users who are generally ignorant of the inherent hazards of confined pressure and it is further important to minimize the risk of liability exposure to the retest facility which can be heightened through improper or inadequate evaluation of a cylinder condition.

We feel that it must be additionally realized that the majority of DOT specification cylinders being requalified today are not being requalified by personnel with extensive cylinder experience. Most of the cylinders are being retested not at the Airco, Linde, Liquid Air, etc. fill plants, but are rather being requalified in smaller facilities having less than 10 employees, some of whom have been there for three months and may be gone three months from now. Consequently, there is not the "old timer" long term employee/ employer loyalty and caring relationships, the large company safety and training programs, nor the familiarity with test results and visual inspection criteria covering a wide range of cylinder designs, volumes and pressures. It is also true that some of the large gas distributors no longer requalify their own cylinders, but rather "farm out" this requirement to some proximate retester.

A great number of the U.S. population of high pressure cylinders of steel and aluminum and multi component composites are owned by fire departments, welding supply houses, and individuals as in the case of scuba cylinders and fire extinguishers. This fact magnifies the retest control problem since some of these entities fill cylinders, but are not authorized to requalify.

In our opinion, a way to strengthen the regulations would be to require anyone acting as agent for the cylinder owner to acquire and post a current copy of the requalifier's DOT approval letter. This would highlight the importance of the issue and could apply to diving shops, fire extinguisher service companies, welding supply houses and fire departments.

A knowledgeable, responsible, concerned and conscientious requalifier of compressed gas cylinders takes the following actions:

1. Resulation reauirements

In view of hydrostatic expansion results achieved and visual quality levels noted, he will reject or accept.

2. Retest facility concerns

In view of his company's liability concerns and applying conservative yet considered judgement to the cylinder disposition, he will take into account the fact that the cylinder can remain in service for some extended period without further internal inspection or hydrostatic testing, meanwhile bearing his RIN number. If his initial results on either test or visual are borderline acceptable, he will be prone to reject or condemn the cylinder.

Despite the legality of approach to item#2, these are real life judgement calls made every day by concerned requalification personnel.

REVISION OF RETEST TABLE

Authorized Testing believes that the retest table is vital if one of the goals is to direct attention to and increase knowledge of this section of the regulations.

Even though copy of current exemptions is specifically required under General Requirements, Authorized Testing feels that additional reference is appropriate added to the table as shown here:

Specification under which cylinder was made	Minimum Retest Pressure (PSI)	Retest period (years)
DOT3		
Exemptions (Composite)	5/3 times service pressure	3 years
Exemptions (Other)	See current exemption	See current exemption

#### GENERAL REQUIREMENTS AND RETESTER AUTHORIZATION

Authorized Testing is in agreement with proposed requirements for maintenance of specific documents including CGA pamphlets and current exemptions where applicable. However, there is a conflict in most composite exemptions which does not authorize repairs and CGA pamphlet C6.2 which provides guidelines for repairs.

DOT FRP Standards on which composite exemptions are based also requires that water jacket testing be performed. Authorized Testing feels that this is an important requirement to the composite cylinder manufacturer, user and retester and should be a continued requirement at this time.

We know of only a very few retesters who perform direct expansion testing (1 or 2) and they are applying the practice to vessels described in CFR49 Sections 173.31 and 173.32, mostly one ton chlorine tanks.

#### PROPOSED PARAGRAPH (e)(4)(iii)

Authorized Testing believes it is appropriate and useful to require calibration at the beginning of each work shift. To do so can reduce the number of improper tests which may otherwise be performed, can be an attention point for the new operator and can further pinpoint accountability to specific individuals.

Authorized Testing further agrees with RSPA proposal in paragraph (e)(4)(iii) to permit two means of calibration (a) at test pressure (b) at test pressure above and below test pressure used. However, AT believes the language should require this calibration be "WITHIN 250 PSI OF TEST PRESSURE".

#### APPARATUS MALFUNCTION

Authorized Testing believes that immediate retesting of a cylinder after equipment malfunction does not affect the outcome of the test when testing single component cylinders of steel and aluminum.

However, there is a right way to perform the retest which will avert the need to perform subsequent and additional retests. After correction of the condition, cylinder should be pressurized again to original retest pressure, stabilization verified, and pressure increased from that point by 10 percent or 100 PSI whichever is less.

Composite cylinders take longer to retract and recover their original status and should be held for 24 hours before retesting, using the same procedure noted above.

Limiting the number of properly performed retests is in our opinion an appropriate measure. We believe that number should be two retests subsequent to initial retest attempt.

Most high pressure cylinders produced from single component material should accept easily a 10 percent accidental over pressurization without damage unless the cylinder integrity has been degraded by some other unrelated media such as temperature.

Since composite cylinder fatigue life is demonstrated by design qualification testing at specific levels, it is difficult to determine the specific over pressurization level which could affect or injure this limited life cylinder. Authorized Testing suggests that accidental over pressurization of the composite cylinders be limited to 1.06 times the required test pressure. This level will not exceed the autofrettage pressure applied by the manufacture during fabrication and will still permit the two subsequent retests described above.

#### PROPOSED PARAGRAPHS (e)(5)(ii) and (e)(6)(ii)

Authorized Testing agrees with the proposal to require notification of the cylinder owner by the retester regarding rejection or condemnation of the cylinder. We further believe that the status of the cylinder should be noted (see attached form devised by Authorized Testing and offered to retesters during discussion of this issue). We do not believe however, that the retester should advise the owner in writing of remedial actions. Since RSPA is appropriately removing the unused provision for reheat treatment, what could the retester tell the owner to do? Authorized Testing further believes that such advisory action on the part of the retester could increase his risk of liability.

#### STAMPING OF CONDEMNED CYLINDERS

Authorized Testing has mixed emotions regarding this proposal. On one hand we feel comfortable in evaluating equipment functional capability and the retester's knowledge of equipment use and regulation requirements. On the other hand, we still feel some reluctance in providing the retester carte blanche authorization to destroy the cylinder.

We recognize that there is some degree of contradiction in this position.

Frankly, we do not feel that the level of expertise in the cylinder retest industry is sufficient to prevent the wasteful destruction of perfectly acceptable cylinders. It would appear that there should be a greater recognition of the distinctions between malfunctioning test equipment and failing cylinder behavior.

Couple this assessment with the limiting 5 percent permanent expansion of the composite cylinders and the resulting possible loss of cylinders owned by small fire departments could be disastrous.

It might be time to interject that Authorized Testing would support a move to increase the allowable permanent expansion on all composite cylinders to 10 percent. We believe that would allow some room for minutely eccentric behavior of the test apparatus without compromising safety and would greatly reduce our opposition to physical condemnation of cylinder failure reflective of the hydrostatic test.

We would not propose to alter the 5 percent requirement of the manufacturer. To do so could defeat the purpose since manufacturers could maximize on the less restrictive permanent expansion requirement and because of the nature of the composite cylinder we could again have the same problem.

We believe the composite cylinder manufacturers would welcome a move to 10 percent maximum permanent expansion at retest and it would bring all cylinders at retest back to the same requirement. Some composite cylinders of small volume (60 cu.in. or less) have already been given relief in this area under terms of the exemption covering retest requirements. Under the current proposal to permit physical destruction of the cylinder by Xing out the exemption or DOT markings, there is a danger that at least on composite cylinders such damage could be hidden by someone with a little paint and bondo. Particularly true if the test report reveals a permanent expansion of 5.1 percent. These small SCBA cylinders represent a large portion of a small fire department's limited budget.

#### RETEST RECORDING

Authorized Testing agrees with most of the proposed recording requirements, except for two.

1. There are many cylinders of older vintage in service where it is extremely difficult for a retester to determine the cylinder maker. Many of such cylinders were permitted to be marked with the buyer's symbol such as AIRCO or LINDE. It would appear that from a compliance control or investigative point of view, it would be more meaningful to identify the current owner of the cylinder. Having that knowledge could lead to location of the cylinder and ultimately to the cylinder manufacturer who will be identified somewhere in the markings regardless of vintage.

2. We do not believe that requiring recording of cylinder dimensions is critical. We do believe that recording of volumetric capacity is useful and is the description normally applied by current retesters. Most cylinders are recognized in the industry by their cubic foot size such as 45 cu.ft. air SCBA, 80 cu.ft. air Scuba, 110 cu.ft. oxygen, etc. Some are more readily identifiable as medical B, medical D and medical E. Others are described as 5, 10, 15 or 20# C02.

We do believe that retest records must absolutely reflect the specification marking including the marked service pressure. We feel this is important for several reasons.

1. It requires the retester to be in tune with the cylinder he is testing and the restraints and requirements of the retest procedure involving that particular cylinder. For example: If he records Special Permit number or Exemption suitable for remarking to DOT 3AL, the act of recording will flag him to note the fact in the "remarks" column. We recently discovered exemption cylinders in C02 Carbonic use in Flagstaff, Arizona which were produced in 1981 and had not been retested or remarked to reflect specification 3AL.

Such action will also remind the retester that he is dealing with an aluminum cylinder which cannot be marked with a plus sign under any circumstance.

#### RECORDING MANUFACTURING DATE

We believe it is essential that the earliest date noted on the cylinder be recorded. There are limited life cylinders in service such as DOT 3HT and composite exemption cylinders which require removal from service at the termination of specific time periods. Clearly requiring this recording can be a flag to the retester as to the status of that particular cylinder. This knowledge will assist him in his advisory to the cylinder owner. We have discovered that many fire department personnel who use composite SCBA's and many small aircraft owners who use 3HT cylinders are unaware their cylinder has limited life service. This fact is not generally found in the large print of the manufacturer's promotional data or in the sales brochure of the equipment supplier.

#### PLUS MARKING OF CYLINDERS

Authorized Testing believes strongly that marking of the + (plus) sign should be restricted to those steel industrial and small medical cylinders used only for permanent gases, owned by a bonafide company or corporation and that they should not include SCBA air cylinders or Scuba diving cylinders.

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It would seem that with this regulation rewrite would be an appropriate time to attack the abuse of this practice by the breathing air industry. Future cylinder specification consolidations I understand will address this issue. Our current advice to our retest clients is not to plus mark cylinders they cannot identify to those with REE values, dimensions, specifications and pressures noted in CGA pamphlet C5. We have found remarkable acceptance of this advice. The steel 3AA Scuba and SCBA cylinders are the most abused and misused in this respect. For example: plusing a 71.2 cu.ft. diving air cylinder manufactured with a calculated wall stress approaching the 70,000 PSI maximum and used almost exclusively in salt water service, does not make good safety sense.

Most of the welding supply owned cylinders and those of large filling facilities can be readily identified to CGA C5. It is understood that excluding breathing air cylinders from + (plus) may not completely and immediately stop the practice since a plus stamp can be purchased at any hardware store and applied by anyone with a mind to do so. Restriction would however remove the legality and alert the fillers of such cylinders that fill limits were restricted to marked service pressure.

PROPOSED PARAGRAPH (e)(8)

Authorized Testing agrees with the proposed requirement to maintain all the prescribed documents listed.

We further suggest that both the calibration cylinder Certificate of Calibration and the RIN issuance letter from RSPA be required to be posted at or near the test apparatus. We also suggest that it would be very helpful to stress the 50 day advance renewal application requirement and would assist in circumventing the need for the independent inspector to intercede for the retester in expediting the inspection to avoid shutdown of the retest facility.

Thank you for the opportunity to comment on these matters.

Sincerely for cylinder safety,



Rex Greer  
President  
AUTHORIZED TESTING, INC.



CYLINDER FAILURE FORM

Date \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The cylinder retest agency shown above has determined compressed gas cylinder (s):

Serial Number (s)	Type
_____	_____
_____	_____
_____	_____
_____	_____

to be unfit for further service and to possibly constitute a serious hazard to life and property if again charged and placed in service.

REASON FOR CONDEMNATION:

\_\_\_\_\_ Excessive permanent expansion  
\_\_\_\_\_ Excessive corrosion  
\_\_\_\_\_ Evidence of fire exposure  
\_\_\_\_\_ Bad threads  
\_\_\_\_\_ Other [specify] \_\_\_\_\_

Signed \_\_\_\_\_  
[Cylinder owner or  
representative]

Signed \_\_\_\_\_  
[Responsible facility  
manager]

CYLINDER FAILURE FORM

Date January 11, 1996

ACTION FIRE CONTROL

2801 Century Blvd.

Los Gatos, New Mexico

The cylinder retest agency shown above has determined compressed gas cylinder ~~(s)~~:

Serial Number (s)	<u>W16973</u>	Type	<u>20# CO2</u>
	<u></u>		<u></u>
	<u></u>		<u></u>
	<u></u>		<u></u>

to be unfit for further service and to possibly constitute a serious hazard to life and property if again charged and placed in service.

REASON FOR CONDEMNATION:

<u></u>	Excessive permanent expansion
<u></u>	Excessive corrosion
<u></u>	Evidence of fire exposure
<u></u>	Bad threads
<u>X</u>	Other [specify] <u>Arc Burns</u>

Signed <u><i>J. M. Amased</i></u>	Signed <u><i>R. M. Serious</i></u>
[Cylinder owner or representative]	[Responsible facility manager]